APPENDIX F

BIOLOGICAL RESOURCES TECHNICAL REPORT

BIOLOGICAL RESOURCES TECHNICAL REPORT FOR THE SAN ELIJO LAGOON RESTORATION PROJECT SAN DIEGO COUNTY, CALIFORNIA

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LIST OF ACRONYMS AND ABBREVIATIONS

AOU	American Ornithologists' Union
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
BSA	Biological Study Area
CCA	California Coastal Act of 1976
CCC	California Coastal Commission
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
cm	centimeter(s)
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	U.S. Army Corps of Engineers
County Parks	County of San Diego Parks and Recreation Department
CWA	Clean Water Act
dBA	A-weighted decibel(s)
EFH	essential fish habitat
EIR	environmental impact report
EIS	environmental impact statement
ESA	Endangered Species Act
FR	Federal Register
HCP	habitat conservation plan
Highway 101	Pacific Coast Highway 101
I-5	Interstate 5
JDR	Jurisdictional Delineation Report
m	meter(s)
MBTA	Migratory Bird Treaty Act
MHCP	Multiple Habitat Conservation Plan
MHHT	mean high high tide
MHHTL	mean high high tide line
MLLT	mean low low tide
mm	millimeters(s)
MSCP	Multiple Species Conservation Program
North County MSCP	North County Multiple Species Conservation Program

NCTD	North County Transit District
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NOAA	National Oceanic and Atmospheric Administration
NPPA	Native Plant Protection Act
PCE	primary constituent element
Reserve	San Elijo Lagoon Ecological Reserve
RWQCB	Regional Water Quality Control Board
SDNHM	San Diego Natural History Museum
SELC	San Elijo Lagoon Conservancy
SELRP	San Elijo Lagoon Restoration Project
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service

CHAPTER 1.0
INTRODUCTION

1.1 PURPOSE OF STUDY

San Elijo Lagoon represents a valuable coastal wetland with significant biological and ecological resources within the San Diego region. Over time, development and infrastructure within the lagoon and upstream in the watershed have restricted the natural movement of water flowing in and out of the lagoon (tidal prism) and modified freshwater flows and inputs sedimentation has increased. As a result, ecological functions of the lagoon have been compromised, leading to degraded water quality and elevated bacteria levels. Because of physiological and hydrological changes in circulation patterns, lagoon habitat has experienced substantial transformation, including conversion of historical mudflat areas to low-marsh. If no action is taken to restore the lagoon, it would continue to transition from a lagoon with a mosaic of habitats, including open water/mudflats, to a less diverse lagoon dominated by salt marsh. Eventually, based on sea level use predictions, even that marsh would be substantially inundated.

The San Elijo Lagoon Conservancy (SELC) proposes to restore lagoon functions as a part of a larger goal to protect a diverse assemblage of self-sustaining coastal habitats important to the region. The proposed San Elijo Lagoon Restoration Project (SELRP) aims to enhance the tidal prism of the lagoon by proposing modifications to some existing infrastructure that contribute to hydraulic constraints, such as Pacific Coast Highway 101 (Highway 101), and benefiting from proposed improvements to other infrastructure including the North County Transit District (NCTD) railroad, and Interstate 5 (I-5).

The purpose of this Biological Resources Technical Report (report) is to summarize the biological resources known to occur, or with the potential to occur, in San Elijo Lagoon, as well as to analyze the short-term and long-term impacts (both positive and negative) of the SELRP. San Elijo Lagoon has been a focus of many biological studies, including annual wildlife species surveys, fish and invertebrate surveys, and single survey efforts (e.g., BioBlitz). These efforts have been driven by different projects, individuals, and/or agencies, and have been conducted at different levels of detail or within different portions of the lagoon. As a result, a substantial amount of existing information is available to characterize current biological resources in the lagoon but the consistency across the lagoon varies. In addition, a number of focused studies have been conducted as part of the preliminary planning process for SELRP. This report represents a compilation of both existing characterization information and specific focused studies conducted for the SELRP.

1.2 LIMITS AND PURPOSE OF PROJECT

1.2.1 Limits of the Project

The San Elijo Lagoon Ecological Reserve (Reserve) is located at the southern boundary of the City of Encinitas adjacent to Solana Beach (Figure 1-1). The lagoon is owned and managed by the State of California (California Department of Fish and Wildlife [CDFW], formerly California Department of Fish and Game [CDFG]); the County of San Diego Department of Parks and Recreation; and the SELC. The lagoon provides habitat for sensitive, threatened, and endangered plants and animals, as well as migratory wildlife. In addition, San Elijo Lagoon provides recreational opportunities, including over 5 miles of public hiking trails. The lagoon is traversed generally north to south by Highway 101, the NCTD railroad, and I-5. For the purposes of this report, the Biological Study Area (BSA) generally includes the Reserve, as well as an adjacent beach that could be affected by the project.

1.2.2 Purpose of the Project

The overarching goal of the SELRP is to protect, restore, and then maintain, via adaptive management, the San Elijo Lagoon ecosystem and the adjacent uplands to perpetuate native flora and fauna characteristics of southern California, as well as to restore and then maintain estuarine and brackish marsh hydrology. This project goal can be further refined into three categories of objectives:

1. Physical restoration of lagoon estuarine hydrologic functions
2. Biological restoration of habitat and species within the lagoon
3. Management and maintenance to ensure long-term viability of the restoration efforts

The objectives below have been identified within these three larger categories.

1. Physical Objectives

A. Open the lagoon mouth regularly, or create a permanently open mouth, to enhance the health and ecological value of the lagoon.
B. Enlarge the tidal prism to increase area of tidal expression within the lagoon and manage freshwater inputs.
C. Improve water quality through restored tidal circulation thereby reducing impacts to the public from beach closures due to high bacteria counts and the potential for mosquito-borne disease.
D. Ensure no adverse change to current flood protection, specifically to existing infrastructure and adjacent development.

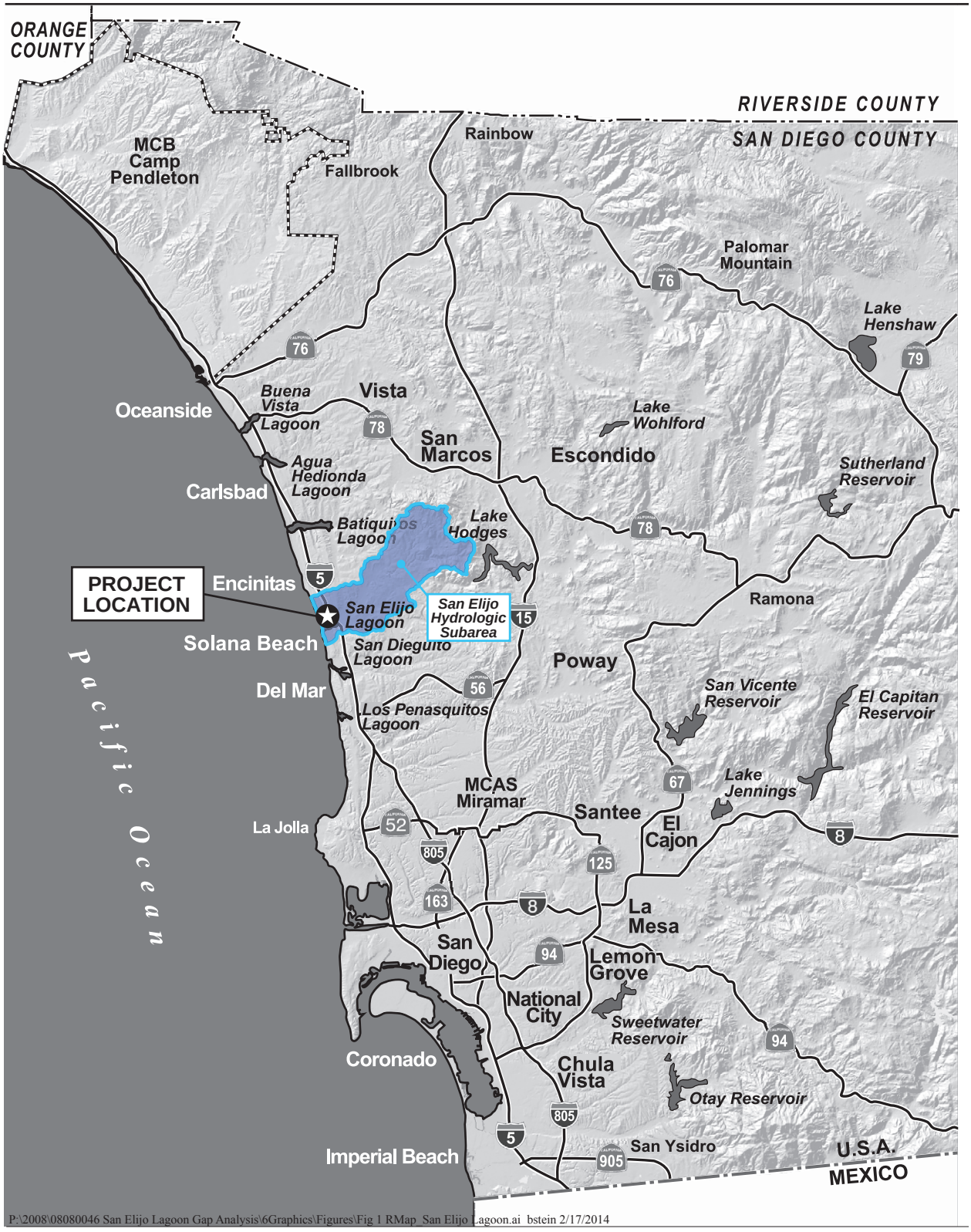

Figure 1-1
Regional Map

E. Minimize the disturbance of cultural resources.

2. Biological Objectives

A. Provide a natural gradient of habitats that considers climate change, anticipated sea level rise, heterogeneity of habitats, and tidal channels of various orders.
B. Enhance habitats for native species, including rare and endangered species, to maintain species diversity appropriate to habitat distribution and regional needs.
C. Maintain lagoon public access and educational opportunities consistent with resource protection needs and requirements.

3. Management and Maintenance Objectives

A. Develop a cost-effective management and maintenance plan for supporting the proposed habitat enhancements, curtailing growth and expansion of exotic species, and maintaining regular tidal flow.
B. Design and implement a biological and hydrological monitoring program on which to assess the success of restoration efforts and base adaptive management decisions.

The SELRP intends to restore the biological and hydrologic functions of the lagoon and adjacent uplands with a balance of habitat types, taking into account regional historic losses and current constraints. The project aims to enhance the tidal prism of the lagoon by dredging material from the lagoon, possibly modifying infrastructure that results in hydraulic constraints (Highway 101), as well as reaping the benefits of changes to other infrastructure (the NCTD railroad and I-5) also causing hydraulic constraints. Modifications to the NCTD railroad and I-5 are being implemented by other project proponents as part of more regionwide infrastructure improvements, but planned bridge improvements are incorporated into selected restoration project alternatives. The approximate target construction start date of the SELRP is the year 2016.

1.2.3 Project Description

Four project alternatives have been identified for the SELRP:

- Alternative 2A – Maximum Habitat Diversity, New Inlet Location
- Alternative 1B – Maximum Habitat Diversity, Existing Inlet Location
- Alternative 1A – Minimum Changes
- No Project/No Federal Action – Existing Conditions

Brief descriptions of the SELRP alternatives are provided below.

1.2.3.1 Alternative 2A – Maximum Habitat Diversity, New Inlet Location

Alternative 2A would also provide changes to the existing site to create a greater diversity of habitats than presently exists. Seawater would enter the lagoon via a new (and wider) tidal inlet located south of the existing inlet and a new subtidal basin would be created just landward of the new inlet in the West and Central Basins. The main tidal channel would extend throughout the lagoon and be redirected just west of I-5, and extend into the East Basin. Infrastructure improvements are assumed at the NCTD railroad trestle, including the portion of the railroad directly parallel to the new inlet, and the bridge under I-5 is assumed to be widened. The channel in the East Basin would be identical to that for Alternative 1B. The tidal prism of Alternative 2A would increase compared to Alternative 1B. Nontidal habitat areas remain in the East Basin. Transitional habitat areas above tidal elevations would also be included in the Central Basin as with Alternative 1B. Figure 1-2 illustrates the conceptual plan under Alternative 2A–proposed project.

A proposed habitat distribution plan was developed for Alternative 2A–proposed project, to provide a diversity of habitats that would remain relatively stable through time, assuming consistent maintenance. Table 1-1 identifies the habitat distribution that is projected under Alternative 2A–proposed project.

Table 1-1
Alternative 2A – Applicant's Proposed Project Habitat Distribution

Habitat Type	Habitat Distribution (acres)		Habitat Type	Habitat Distribution (acres)	
	Existing[1]	Proposed		Existing[1]	Proposed
Avian Islands	0	2	Open Water/Tidal Channels and Basins	40	74
Mudflat	63[2]	102	Riparian	72	67
Low-Marsh	13	23	Coastal Strand	5	5
Mid-Marsh	141	124	Upland & Others	299	292
High-Marsh	120	107	Beach	15	14
Saltpan	37	17	Berms and Roads	23	24
Freshwater/Brackish Marsh	132	96	Transitional (man-made)	0	12

[1] Existing habitat acreages are from 2012 mapping efforts and reflect habitat distributions at that time.
[2] Current functioning mudflat is an artifact of past freshwater impoundment and is converting to low- and mid-marsh because it is not at a natural elevation for self-sustainable mudflat.
Source: Nordby and M&N 2012

1.2.3.2 Alternative 1B – Maximum Habitat Diversity, Existing Inlet Location

Alternative 1B would provide a more substantial change to the existing site to create a greater diversity of habitats than currently exists. The existing tidal inlet would remain the source of seawater. The main tidal channel would include extended matrices of mudflats. d Secondary channels would be created south of the main channel in the central basin. Existing emergent low-marsh would be retained to the extent possible to create a diverse habitat distribution in the basin. The main feeder channel would be redirected just west of I-5 and extended farther into the East Basin. No infrastructure improvements are assumed at the NCTD railroad trestle, but the bridge under I-5 is assumed to be widened. Thus, the channel in the East Basin would be significantly enlarged in cross-sectional area to promote more tidal exchange east of I-5. The tidal prism of Alternative 1B would be significantly increased compared to Alternative 1A. Nontidal habitat areas would still exist in the East Basin. Several areas of transitional habitat above tidal elevations would be placed in the western portion of the Central Basin. Figure 1-3 illustrates the conceptual plan under Alternative 1B.

A proposed habitat distribution plan was developed for Alternative 1B to provide a diversity of habitats that remains relatively stable through time, assuming consistent maintenance. Table 1-2 identifies the habitat distribution projected under Alternative 1B.

Table 1-2
Alternative 1B Habitat Distribution

Habitat Type	Habitat Distribution (acres)		Habitat Type	Habitat Distribution (acres)	
	Existing[1]	Proposed		Existing[1]	Proposed
Avian Islands	0	2	Open Water/Tidal Channels and Basins	40	67
Mudflat	63[2]	71	Riparian	72	67
Low-Marsh	13	51	Coastal Strand	5	5
Mid-Marsh	141	98	Upland & Others	299	295
High-Marsh	120	124	Beach	15	15
Saltpan	37	30	Berms and Roads	23	24
Freshwater/Brackish Marsh	132	99	Transitional (man-made)	0	12

[1] Existing habitat acreages are from 2012 mapping efforts and reflect habitat distributions at that time.
[2] Current functioning mudflat is an artifact of past freshwater impoundment and is converting to low- and mid-marsh because it is not at a natural elevation for self-sustainable mudflat.
Source: Nordby and M&N 2012

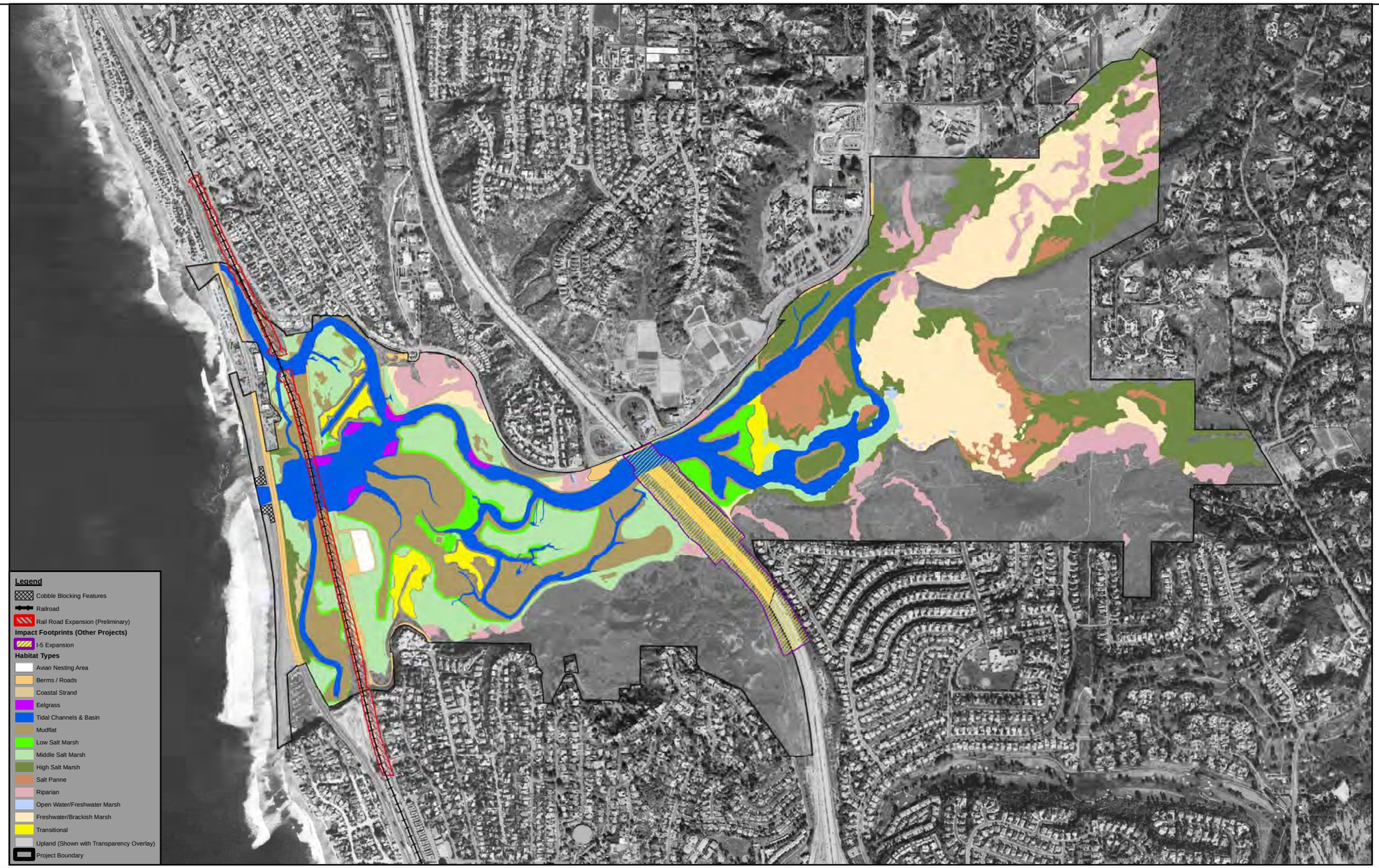

Figure 1-2
Alternative 2A

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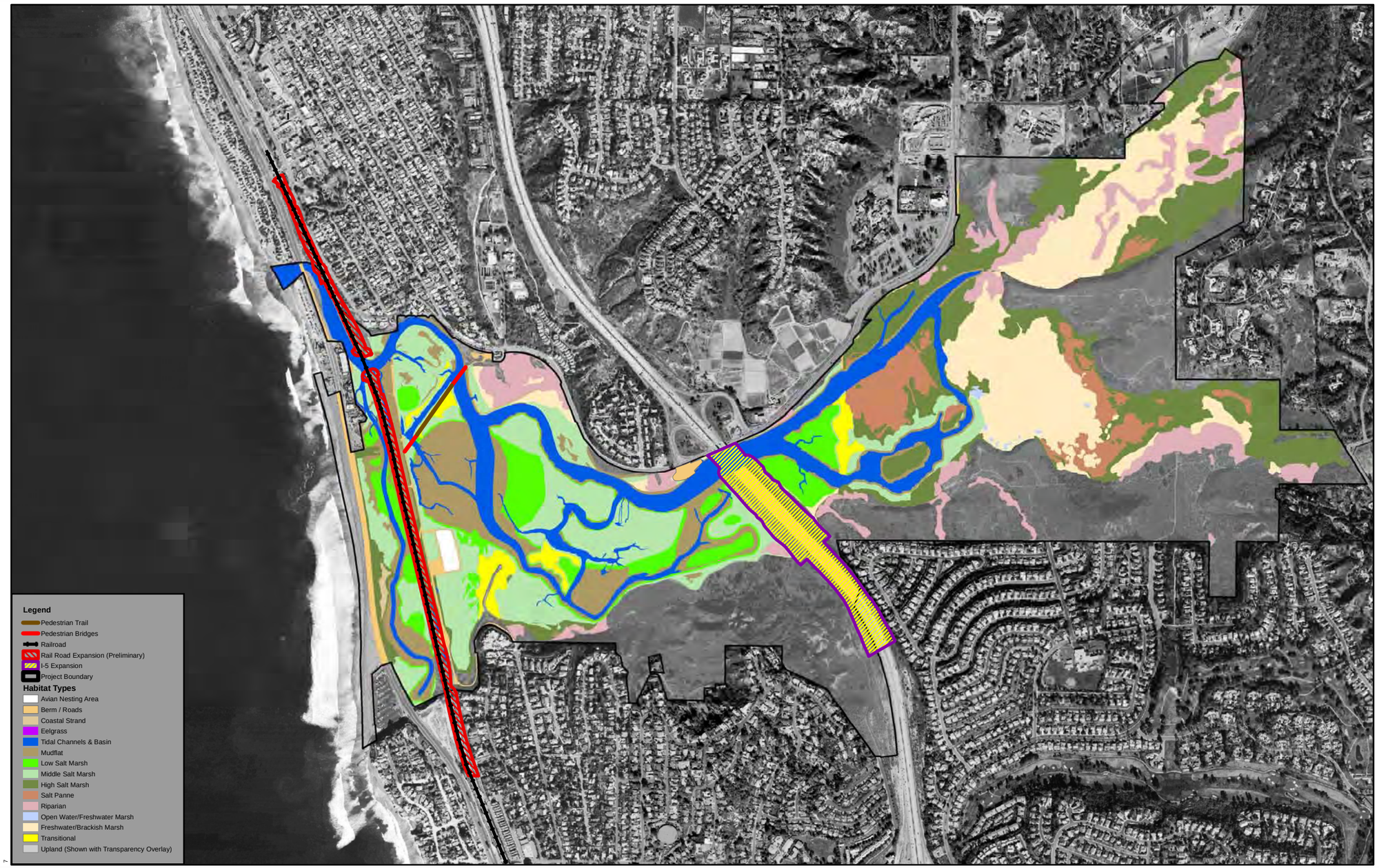

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Figure 1-3
Alternative 1B

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1.2.3.3 Alternative 1A – Minimum Changes

Alternative 1A would provide minimal physical changes to the site, with the exception of enlarging the main feeder channel throughout the site and redirecting its course just west of I-5. The main tidal channel would also be extended farther into the East Basin and existing constricted channel connections would be cleared and enlarged. The inlet/undercrossing at Highway 101 would remain in the current location. No other infrastructure improvements are assumed to be made at the NCTD railroad trestle or at I-5. Existing habitat areas would essentially remain intact. The tidal prism of Alternative 1A would be slightly increased compared to existing conditions. A relatively small area of transitional habitat above tidal elevations would be placed in the northwest portion of the Central Basin. Figure 1-4 illustrates the conceptual plan under Alternative 1A.

The proposed habitat distribution for Alternative 1A from dredging and grading activities is summarized in Table 1-3. This assumes consistent maintenance.

Table 1-3
Alternative 1A Proposed Habitat Distribution

Habitat Type	Habitat Distribution (acres)		Habitat Type	Habitat Distribution (acres)	
	Existing[1]	Proposed		Existing[1]	Proposed
Avian Islands	0	2	Open Water/Tidal Channels and Basins	40	34
Mudflat	63[2]	25	Riparian	72	70
Low-Marsh	13	44	Coastal Strand	5	5
Mid-Marsh	141	140	Upland & Others	299	299
High-Marsh	120	145	Beach	15	15
Saltpan	37	35	Berms and Roads	23	24
Freshwater/Brackish Marsh	132	121	Transitional (man-made)	0	2

[1] Existing habitat acreages are from 2012 mapping efforts and reflect habitat distributions at that time.
[2] Current functioning mudflat is an artifact of past freshwater impoundment and is converting to low- and mid-marsh because it is not at a natural elevation for self-sustainable mudflat.
Source: Nordby and M&N 2012

1.2.3.4 No Project/No Federal Action Alternative – Existing Conditions

The No Project/No Federal Action alternative assumes no changes would be made to the project site and existing conditions (including the continued transition from tidal mudflat and cordgrass marsh to high-saltmarsh and freshwater marsh) may remain into perpetuity. The lagoon currently experiences mouth constriction and manual reopening annually, and sometimes more frequently. Tidal flushing is restricted, and water quality conditions are impaired for nutrients, bacteria, and sediment (SCCWRP 2007). Habitat is distributed at elevations and locations that are related to relic closed mouth conditions and that are progressively transitioning to distributions more reflective of managed mouth conditions. For example, mudflat habitat is located too high for a full tidal lagoon because it formed when the mouth was closed and lagoon water levels were higher from impoundment. Now that the mouth is managed to be open, the mudflat is converting to vegetated marsh because hydrologic conditions are favorable for salt marsh plant growth.

Historically, high water elevations resulting from frequent mouth closures and water impoundment in the lagoon have resulted in mudflat and open water/tidal channels habitats. Over the last decade, active management of an open lagoon mouth has been implemented, which has resulted in rapid habitat conversion. Specifically, the existing mudflat is converting to low-marsh habitat and portions of mid-marsh are anticipated to convert to high-marsh. The rapid conversion of mudflat was observed between 2010 and 2012, with a gain of 13 acres of low-marsh (cordgrass dominated) habitat and a direct loss of mudflat. Ultimately, the conversion of another 34 acres of mudflat is anticipated as the lagoon moves toward a state of equilibrium with current water levels and inundation frequencies.

The practice of active management at the lagoon mouth is expected to continue under this alternative to maintain tidal exchange with the ocean and allow fluvial flows to exit the lagoon. This exchange, although limited by the existing hydraulic constraints in the lagoon, maintains more acceptable water quality levels in the lagoon. When the inlet closes to tidal flushing, the lagoon water quality rapidly deteriorates due to the nutrient load stored in the existing sediments and the impoundment of freshwater from the watershed.

Therefore, under this alternative, open water/tidal channels would continue to decrease as would mudflats and mid-saltmarsh habitat (Table 1-4). Low-and high-saltmarsh habitat would continue to increase. Currently, no tidally influenced high-saltmarsh is on the site as the existing high-saltmarsh is located upstream of the current extent of tidal influence due to historic water impoundment behind the CDFW dike. Maintaining existing tidal influence would increase tidally influenced high-marsh and preserve brackish and freshwater high-marsh.

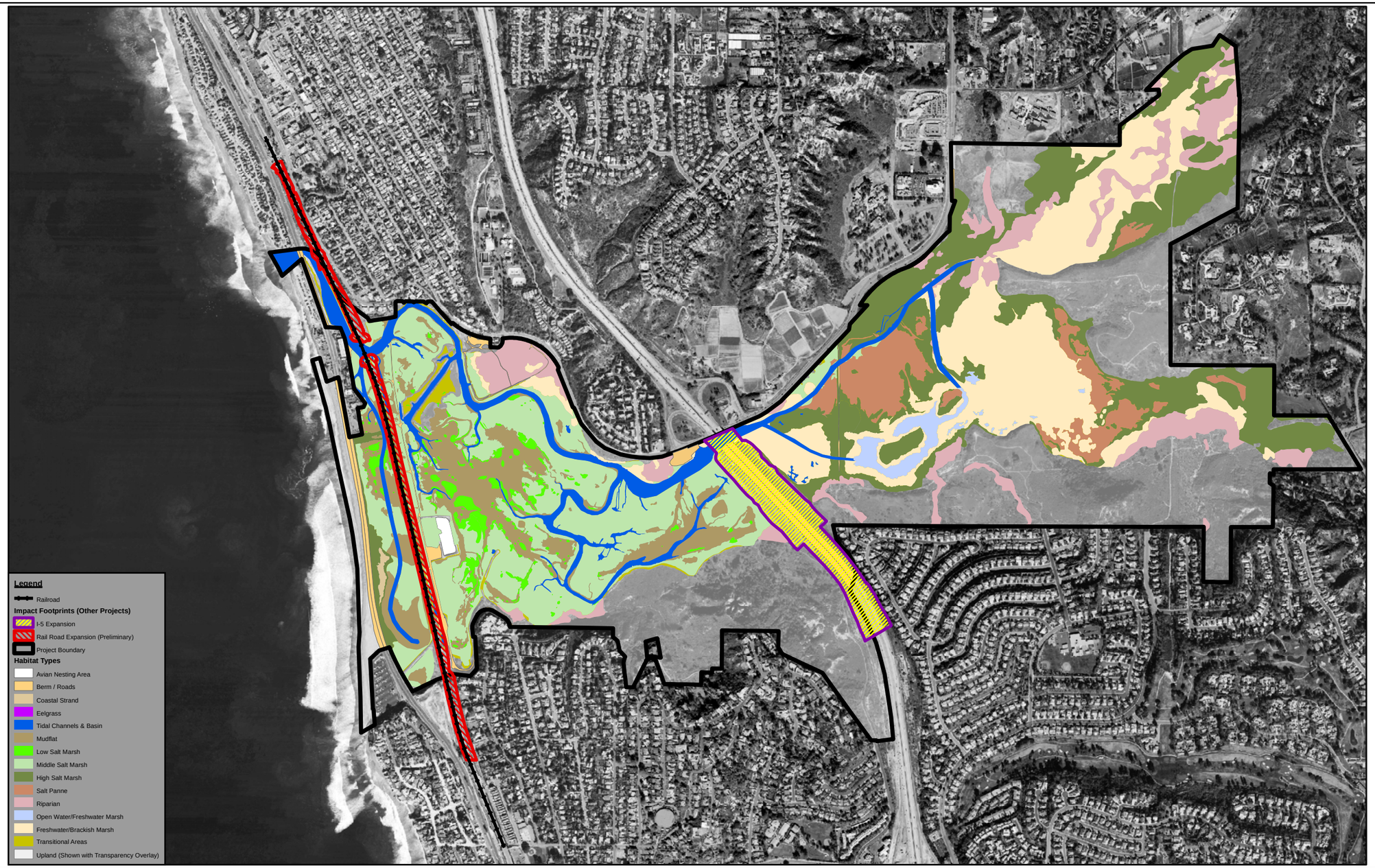

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Figure 1-4
Alternative 1A

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Table 1-4
No Project/No Federal Action Alternative Habitat Distribution

Habitat Type	Habitat Distribution (acres)		Habitat Type	Habitat Distribution (acres)	
	Existing[1]	Predicted		Existing[1]	Predicted
Avian Islands	0	0	Open Water/Tidal Channels and Basins	40	24
Mudflat	63[2]	29	Riparian	72	71
Low-Marsh	13	51	Coastal Strand	5	5
Mid-Marsh	141	107	Upland & Others	299	299
High-Marsh	120	167	Beach	15	15
Saltpan	37	37	Berms and Roads	23	23
Freshwater/Brackish Marsh	132	131	Transitional (man-made)	0	0

[1] Existing habitat acreages are from 2012 mapping efforts and reflect habitat distributions at that time.
[2] Current functioning mudflat is an artifact of past freshwater impoundment and is converting to low- and mid-marsh because it is not at a natural elevation for self-sustainable mudflat. The decrease in mudflat reflects the remaining mudflat in the equilibrium condition (after predicted conversion has occurred).
Source: Nordby and M&N 2012

1.2.3.5 Project Design Features and Long-term Monitoring Program

The SELRP is a restoration project designed to enhance the lagoon system as a whole. Due to the nature of the project, an effort has been made to proactively incorporate measures into each of the alternatives to minimize and avoid, where possible, impacts to resources. These "design features" represent a commitment by the SELC to construct the project in an environmentally sensitive way. Some design features are incorporated to avoid or minimize a potential significant impact proactively through design, but others are additional measures that support the overall restoration objectives of the project without being tied to a specific potential impact. These features are committed to by the project applicant and would be implemented by the contractor or other parties before, during, and after construction. These features are summarized in Table 1-5, which identifies not only the measure, but also the purpose, timing, and responsibility for implementation of each project design feature.

In addition to project design features, the project would include long-term monitoring, maintenance, and adaptive management. Implementation of the SELRP would require a comprehensive monitoring program to ensure compliance with regulatory requirements, track project success, and identify adaptive management strategies into the future.

A comprehensive restoration construction plan would be prepared once the final alternative is selected. Regardless of the alternative, the restoration plan would include requirements for pre-

Table 1-5
Summary of Design Features/Monitoring Commitments and Minimization Measures

Project Design Feature ID	Design Features	Purpose	Timing	Implementation Responsibility
	General			
PDF-1	Implement a public information program to assist nearby residents in understanding the purpose of the project and disseminate pertinent project information.	Reduce impacts related to land use incompatibilities.	Prior to and during construction	SELC
PDF-2	Maintain project website with current construction schedule.	Ensure timely public notification; minimize land use conflicts.	During construction	SELC
PDF-3	Conduct fueling and/or maintenance activities at designated staging areas and designated fueling areas, and prepare a Spill Prevention, Control, and Countermeasure plan for hazardous spill containment.	Minimize safety hazards associated with release of hazardous materials.	During construction	Contractor
PDF-4	Stake construction areas and no construction zones. Limit construction equipment and vehicles to within these limits of disturbance.	Protect sensitive habitat areas; reduce public safety hazards.	During construction	Contractor
PDF-5	Restrict access to portions of lagoon trails and beaches to maintain public safety.	Reduce risks to public health and safety.	During construction	Contractor
PDF-6	Maintain alternative access to beaches adjacent to placement sites, portions of trails not under active construction, and the Nature Center.	Minimize impact on public access.	During construction	Contractor
PDF-7	Shield and direct night lighting toward nonsensitive lagoon areas or the ocean and away from residences and habitat.	Minimize effects on residents and sensitive species.	During construction	Contractor
PDF-8	All construction equipment, fixed or mobile, would be equipped with properly operating and maintained mufflers.	Minimize noise impacts.	During construction	Contractor
PDF-9	House exposed engines on dredging equipment to the greatest extent possible.	Minimize noise impacts.	During construction	Contractor
PDF-10	Contractors shall maintain equipment and vehicle engines in good condition and properly tuned per manufacturers' specifications. Idling time for construction equipment will be minimized, as appropriate	Minimize air quality impacts and greenhouse gas (GHG) emissions.	During construction	Contractor
PDF-11	All storage, handling, transport, emission, and disposal of hazardous materials shall be in full compliance with local, state, and federal regulations (Health and Safety Code, Division 20, Chapter 6.95, Article 2, Section 25500-25520)	Avoid impacts associated with hazardous materials.	During construction	Contractor

Project Design Feature ID	Design Features	Purpose	Timing	Implementation Responsibility
	Lagoon Restoration			
PDF-12	Utilize continuous construction, with internal phases to (1) restrict vegetation clearing and grubbing to outside the breeding season (February 15–September 15) (2) limit active construction to two basins at a time (excludes construction of Coast Highway 101).	Minimize impacts to sensitive wildlife species and their habitats.	During construction	Contractor
PDF-13	Have Biological Monitor on-site during construction; frequency may vary depending upon activity but could be daily during breeding season or every other week at other time periods. While clearing and grubbing activities are occurring, walk along the impacted habitat ahead of machinery in an effort to flush the birds and other wildlife. Also, while monitoring, remove sources of impounded water resulting from construction equipment (if any) and confirm compliance with construction specifications regarding no ponding. Ensure no encroachment into sensitive "no construction" zones.	Confirm implementation of biological permit conditions, design features, mitigation measures, and applicable construction specifications.	During construction	Qualified biologist
PDF-14	Prior to initiating construction, identify sensitive "no construction zones" and fence or flag those areas	Minimize impacts to sensitive habitat areas.	Prior to construction	Qualified biologist/Contract
PDF-15	Use wet construction methods to the extent possible.	Minimize impacts to water quality (minimize temporary grading and roads, and exposure of graded soils) and sensitive species and habitats.	During construction	Contractor
PDF-16	Initiate flooding of habitat areas outside of the breeding season. If flooding is reduced and required again within the same year, reinitiation of flooding will occur outside the breeding season as well.	Minimize impacts to breeding bird nests and nesting activity.	During construction	Contractor
PDF-17	Clear and grub activities will occur in sensitive habitats in flooded areas. If clear and grub is required in dry conditions, a qualified biological monitor will walk ahead of the impact area to flush birds and other wildlife if conditions are appropriate and safe.	Minimize impacts to resident bird species and sensitive wildlife species.	During construction	Contractor/Qualified biologist
PDF-18	Controlled inundation will be used prior to clearing and grubbing in low- and mid-marsh habitat to actively encourage wildlife to relocate from vegetation to be cleared to adjacent nonimpacted habitat. After at least 24 hours of consistent inundation, grubbing of vegetation within the grading footprint will occur while still inundated to minimize the likelihood of contacting marsh birds.	Minimize impacts to resident marsh bird species.	During construction	Contractor

Project Design Feature ID	Design Features	Purpose	Timing	Implementation Responsibility
PDF-19	Site staging areas and access roads at existing access points and previously disturbed areas, where feasible	Minimize impacts to intact habitat and reduce site preparation requirements.	Final design	Engineer
PDF-20	Implement a targeted habitat enhancement plan for light-footed clapper rail and Belding's savannah sparrow. Enhancement activities may include fencing, public signage, selective vegetation removal (i.e., invasive species or native species not preferred by Belding's savannah sparrow), nesting platforms, perch removal, predator trapping/control, and other techniques deemed effective.	Provide refugia and promote nesting by light-footed clapper rail and Belding's savannah sparrow during construction in areas not directly impacted by construction activities.	During construction, prior to impacting suitable habitat areas	Qualified biologist
PDF-21	Prepare a Storm Water Pollution Prevention Plan (SWPPP) and implement best management practices. The SWPPP must be approved by the County and City of Encinitas as appropriate prior to approval of associated grading plans and confirm that the limits of disturbance shall be maintained within the identified footprint.	Prevent pollutant discharge.	During construction and future maintenance activities	Prepared by QSD certified Contractor; Implemented by a QSP certified Contractor on site
PDF-22	Actively manage water levels by temporarily closing the lagoon inlet.	Minimize release of disturbed sediment to the coast; allow for some settling of sediment and other potential pollutants prior to release of water to the ocean.	During construction	Contractor
PDF-23	Coordinate with the utility service provider for relocating and/or avoiding utilities infrastructure.	Reduce and/or avoid impacts to existing utilities infrastructure.	Prior to construction	SELC and Contractor
PDF-24	Coordinate with affected utility service provider in the event relocation is required.	Minimize utility service disruptions.	During construction	Contractor
PDF-25	Near Solana Beach sewer pipe or other utilities to be left in place, require dredging and excavation activities to stay above the minimum cover required by the utilities' owner.	Avoid impacts to existing utilities infrastructure.	During construction	Contractor
PDF-26	Equipment fueling and maintenance would occur at the designated staging areas and designated fueling areas away from publicly accessible areas.	Ensure public safety.	During construction	Contractor

Project Design Feature ID	Design Features	Purpose	Timing	Implementation Responsibility
PDF-27	During off working hours, secure heavy equipment and vehicles in staging area.	Ensure public safety.	During construction	Contractor
PDF-28	Provide fire suppression equipment on board equipment and at the worksite.	Reduce fire hazard risks.	During construction	Contractor
PDF-29	Require heavy equipment operators to be trained in appropriate responses to accidental fires.	Reduce fire hazard risks.	During construction	Contractor
PDF-30	Design recommendations from the San Diego Association of Governments (SANDAG) Sea Level Rise Study (SANDAG 2013) will be incorporated into pile foundation and abutment protection engineering for bridgework.	Ensure structural integrity of proposed structures.	Prior to construction	Engineer
PDF-31	The new bridges at the railroad and at Coast Highway 101 under Alternative 2B would possess deep pile foundations and well-protected abutments as engineered per appropriate regulatory safety requirements. Structures will be designed in accordance with applicable local and state engineering and design standards.	Ensure structural integrity of proposed structures.	Prior to construction	Engineer
PDF-32	The Coast Highway 101 alignment and bridge approach will conform to California Department of Transportation (Caltrans) standards for sight distance and vertical clearance.	Ensure public safety.	Prior to construction	Engineer
PDF-33	Temporary speed limit reduction for the traffic detour approaches and exits will conform to safe highway design speeds.	Ensure public safety.	Prior to construction	Contractor
PDF-34	Maintain two-way circulation on public roadways and access to neighboring commercial establishments during project construction. Restore roadway capacity upon completion of the new Coast Highway 101 bridge.	Minimize traffic conflicts and access issues.	Post-construction	Contractor
PDF-35	Create a temporary pedestrian walkway/bicycle path on the west side of open lanes of Coast Highway 101 to allow beach users to continue to access the beach to the north and south.	Minimize land use conflicts and access issues.	During construction	Contractor
PDF-36	All temporary facilities used for contractor activities shall be returned to either original or enhanced conditions upon completion of the project to the greatest extent possible, if not needed for future maintenance activities.	Minimize land use conflicts and access issues.	Post-construction	Contractor
PDF-37	Restore North Rios, Solana Hills, and Santa Inez trails and access to them to pre-project conditions after completion of construction use.	Minimize recreational conflicts and access issues.	Post-construction	Contractor
PDF-38	Design cobble blocking features (CBFs) to maximize burial and minimize exposed surface; treat with faux finishes to provide a more “naturalized” appearance.	Minimize contrast of new inlet and CBFs with existing beach environment.	Final design	Engineer
PDF-39	A Conditional Letter of Map Revision and Letter of Map Revision must be approved by the Federal Emergency Management Agency prior to approval of associated grading plans, if required			

Project Design Feature ID	Design Features	Purpose	Timing	Implementation Responsibility
PDF-40	Channels and infrastructure improvements (Coast Highway 101/inlet, railroad trestle, or I-5 bridge) shall be reviewed by Caltrans, City of Solana Beach, and City of Encinitas as appropriate prior to approval of associated grading plans.			
	Materials Disposal/Reuse			
PDF-41	Construct longitudinal training dikes at sand placement sites.	Reduce nearshore turbidity.	During construction	Contractor
PDF-42	Release material at offshore stockpile and nearshore sites close to the ocean floor (e.g., directly from a subsurface pipe or via a vertical pipe extending from the barge downward toward the ocean floor).	Reduce drop height, settling time (and potential sand drift and loss), and surface turbidity at offshore (SO-5 and SO-6) and nearshore (off Cardiff) sites.	During construction	Contractor
PDF-43	Monitor water quality per RWQCB 401 Certification; if outside parameters then implement operational controls or halt materials placement, as necessary.	Verify permit compliance.	During construction as per RWQCB 401 Certification	Qualified biologist
PDF-44	Place material around storm drain outlets to allow continuation of proper drainage.	Continue proper drainage.	During construction	Contractor, in coordination with City Engineer
PDF-45	Conduct underwater survey of proposed anchoring, monobuoy, and routes of sinker discharge pipeline to verify absence of sensitive hard-bottom habitat; if found, relocate to avoid impacts.	Avoid direct impacts to sensitive hard-bottom habitats.	Prior to construction	Qualified biologist
PDF-46	Design offshore and nearshore placement sites to avoid artificial reefs, kelp, and other hard-bottom features to the satisfaction of the Corps. Provide a minimum 500-foot buffer zone from kelp beds and potential kelp habitat.	Avoid direct impacts to kelp and sensitive hard bottom habitats.	Final engineering and during materials placement	Engineering contractor and construction contractor
PDF-47	Assess habitat suitability for grunion spawning prior to construction, if construction would occur during the spawning season. Monitor for grunion spawning in construction area if suitable habitat present. If spawning observed, implement protective measures, as appropriate, or relocate/reschedule materials placement.	Minimize impacts to grunion.	March through August and per CDFW annual pamphlet *Expected Grunion Runs* (CDFG 2010a)	Qualified biologist

Project Design Feature ID	Design Features	Purpose	Timing	Implementation Responsibility
PDF-48	A Marine Mammal and Turtle Contingency Plan would be prepared prior to construction approved by National Marine Fisheries Service. A pre-construction contractor training would be conducted by a qualified biologist to educate workers with respect to protected marine species and avoidance measures required by the contingency plan. Monitoring during construction would include marine mammal observers on project vessels who would notify the vessel operator if a protected marine species is in the vicinity.	Reduce interactions between vessels and protected marine species.	Prior to initiation of construction and during construction	Qualified biological
PDF-49	Coordinate barge operations with the U.S. Coast Guard (USCG).	Minimize restricted areas/durations to maximize fishing opportunities.	Prior to initiation of construction and during construction	Contractor
PDF-50	Clearly mark pipelines used during materials transport (including offshore stockpiling efforts), including both floating and submerged, as "navigational hazards."	Warn recreational users of water-based activities to ensure safety and avoidance.	Before and during activities in the ocean	USCG (via construction contractor)
PDF-51	Issue Notice to Mariners and maintain 300-foot buffer around monobuoy.	Warn recreational users of water-based activities to ensure safety and avoidance.	Before and during activities in the ocean	USCG (via construction contractor)
PDF-52	Designate a 300-foot buffer around the lane designated for barges to use to reach disposal/reuse sites and track actual routes. Employ Global Positioning System (GPS) tracking on barges to track disposal activity.	Minimize gear loss and fishing conflicts.	During construction	Contractor
PDF-53	Restrict public access at sand placement sites, both on the beach and in the nearshore ocean adjacent to the pipeline and monobuoy	Public safety during construction.	During construction	Contractor, in coordination with local lifeguards
PDF-54	Temporarily relocate mobile lifeguard towers, if neceessary	Ensure public safety during construction.	During construction	Contractor, in coordination with local lifeguards
PDF-55	Place sand to avoid blocking line-of-sight at permanent lifeguard towers. All sight lines from the viewing platforms of the lifeguard towers would be maintained and there would be no interference with views for the lifeguards.	Ensure public safety during construction.	During construction	Contractor, in coordination with local lifeguards

Project Design Feature ID	Design Features	Purpose	Timing	Implementation Responsibility
PDF-56	Post signs advising the public of the presence of steep sand slopes (e.g., scarps) should they develop on beaches where sand is being placed.	Reduce risks to public health and safety.	During construction	SELC in coordination with Marine Safety departments in the cities of Encinitas, Solana Beach, and San Diego
PDF-57	Prior to opening areas of beach with placed materials, spread the material and check it for potential hazards (e.g., foreign objects in the sand)	Reduce risks to public health and safety.	During construction	Contractor
PDF-58	Coordinate the schedule at individual materials placement site to the extent possible to avoid major holidays and special events.	Minimize land use and recreation conflicts.	During construction	SELC
PDF-59	Dedicated parking lots will be identified for employee parking during peak beach attendance to minimize effects to public parking availability, as necessary. A shuttle would likely be necessary for some of the more distant lots.	Maintain public beach access.	During construction	Contractor
PDF-60	Maintain horizontal access along the back beach where adjacent vertical access is not available. Where horizontal access is limited, (e.g., where a wet beach directly abuts bluffs), vertical access would remain to allow public access on either side of the active sand placement area as long as public safety is not compromised.	Maintain public beach access.	During construction	Contractor
PDF-61	Cover discharge pipeline with sand at consistent intervals to facilitate access from the back beach to the water.	Maintain public beach access.	During construction	Contractor
PDF-62	Notify residents at least 1 week in advance of nighttime construction work within 100 feet of residences; Restrict construction work to no longer than 3 consecutive nights within 100 feet of a specific residence where sleep disturbance may occur.	Notify residents of nighttime noise.	During construction	Contractor
PDF-63	Conduct surf condition monitoring in areas with higher placement volumes than historic placement to verify the modeling results and document the anticipated lack of change in coastal conditions.	Ensure no adverse changes to coastal conditions.	Prior to, during, and following construction activities	SELC and Engineer
PDF-64	Conduct sand placement at the Torrey Pines placement site outside of the bird breeding season (April 1 through September 15, or after August 1 with confirmation of cessation of nesting). Conduct monitoring during sand placement to avoid impacts to foraging snowy plover. Should foraging plover be present, the monitor will direct sand placement away from the foraging plover to allow time for the bird(s) to leave the site. In addition, night lighting shall be shielded and directed away from the back beaches.	Minimize impacts to snowy plover at Torrey Pines placement site.	During materials placement at Torrey Pines.	Qualified biologist

construction local plant salvage and/or seed collection (particular focus would be given to existing rare and sensitive plants), planting plans, weed abatement, and remedial measures, as well as established annual success criteria.

Monitoring for the lagoon restoration component of the SELRP would be primarily focused on the lagoon itself and would include pre- and post-construction monitoring, as well as monitoring for longer-term maintenance and an adaptive management program that would begin following completion of the post-construction monitoring program.

General processes to be monitored are identified in Table 1-6 and are intended to educate maintenance and adaptive management efforts in addition to documenting success of the project goals and objectives. Specific monitoring protocols would be developed as part of the permitting process in consultation with the resource and permitting agencies. A project monitoring plan would be developed as part of this consultation process to identify the monitoring methods, success criteria, and remediation required, if any, of the program to be implemented as part of the SELRP.

Table 1-6
Anticipated Biological Survey Framework for Informing Restoration Success

Type of Survey	Purpose
Benthic Macroinvertebrates	Evaluate the health and functioning of the restored lagoon, due to importance in estuarine food webs. Benthic invertebrates can affect, and be affected by, physical processes, such as erosion, sedimentation, and nutrient cycling. Monitoring would include sampling of both epifauna and infauna.
Fish	Reflect suitability of subtidal habitat as essential fish habitat. As fish are expected to colonize the newly created channels almost immediately, post-construction monitoring for fish in shallow subtidal and intertidal channels would begin immediately following construction.
Light-footed Clapper Rail	Clapper rail utilize many of the habitat types within the lagoon (low and brackish marsh for nesting, in addition to mid- and high-marsh and mudflat for foraging), and the project would affect each of these to different extents. Surveys for this species would inform continued habitat availability for clapper rail within the restored lagoon.
Belding's Savannah Sparrow	Belding's savannah sparrows currently inhabit all three lagoon basins. Post-construction surveys would be designed to provide information on resiliency and recovery of this species.
Secretive Marsh Bird Surveys	Post-construction surveys are anticipated to demonstrate use of newly constructed low marsh habitat as well as resiliency and recovery of secretive marsh bird populations.
General Avian Use of the Restored Lagoon	Monitoring of use of the lagoon by water-dependent birds, including shorebirds, waterfowl, gulls, terns, and others, is anticipated to be conducted monthly for a period of 5 years to assist in determining if the project has met its goals and objectives for improving habitats for bird species.
Habitat/Species Coverage	The development of planted areas, i.e., salt marsh and transition habitats, as well as any sensitive species being tracked, would be monitored post-construction for 5 years in order to document the success of the restoration project's planting plan and inform adaptive management actions.

Monitoring the physical parameters of the lagoon following construction is designed to guide short- and long-term management activities such as inlet maintenance dredging or removal of sediment deposition. Monitoring would include developing protocols for the following lagoon components. Additional requirements may be identified as part of the permitting and final design process.

The restoration plan would include both the anticipated maintenance regime and an adaptive management plan. The maintenance plan would identify those areas of the lagoon that are anticipated to require periodic maintenance, such as inlet or subtidal basin maintenance and/or dredging, or less frequent channel maintenance in other areas of the lagoon. The adaptive management plan would identify remedial measures that may be implemented if success criteria put in place as part of the project or permit conditions are not met or if conditions change during long-term monitoring and need to be addressed. Some of these actions may include, but are not limited to, experimental planting of certain areas, additional dredging, replanting of saltmarsh and transitional habitats, and amendment of soils. Detailed plans would be developed as part of consultation with permitting and natural resource agencies during the permitting approval process; however, it is anticipated that the long-term management plan would be a living document and would be updated on a 10-year interval or more regularly as necessary. General components associated with the adaptive management would include replacement planting, weed abatement, trash removal, bank protection/repair, biological monitoring and maintenance, nesting area management, species-specific monitoring for threatened and endangered species, and inlet and channel maintenance.

1.3 REGULATORY FRAMEWORK

Because of both federal and state discretionary actions, the project requires evaluation pursuant to National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA). Under both NEPA and CEQA, a lead agency is any public agency that is principally responsible for carrying out or approving a project. The U.S. Army Corps of Engineers (Corps) is the federal lead agency responsible for compliance with NEPA. County of San Diego Parks and Recreation Department (County Parks) is the lead agency responsible for compliance with CEQA. The Project will comply with applicable federal, state, and local laws, ordinances, and regulations throughout Project construction and operation. Laws, ordinances, and regulations applicable to biological resources in the Project area are discussed below.

1.3.1 Federal Laws and Regulations

Endangered Species Act

The federal Endangered Species Act (ESA) of 1973 (16 United States Code [U.S.C.] §§ 1531 et seq.) directs the U.S. Fish and Wildlife Service (USFWS) to identify and protect endangered and

threatened species and their critical habitat, and to provide a means to conserve their ecosystems. Section 9 of the ESA makes it unlawful for a person to take a listed animal without a permit. "Take" is defined by the ESA as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct" (16 U.S.C. § 1532(19). Through regulations, the term "harm" is interpreted to include actions that modify or degrade habitats to a degree that significantly impairs essential behavioral patterns, including breeding, feeding, or sheltering.

Section 7 of the ESA directs USFWS to use its existing authority to conserve threatened and endangered species and, in consultation with federal agencies, ensure that any action authorized, funded, or carried out by such agency does not jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is a specific geographic area(s) that is essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but will be needed for its recovery.

Section 7(a)(2) requires federal agencies to consult with USFWS to ensure that the agencies are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species. In consultation for those species with critical habitat, federal actions must also ensure that activities do not adversely modify critical habitat to the point that it will no longer aid in the species' recovery.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703_712) makes it unlawful to take or possess migratory birds, except as permitted by USFWS. The MBTA protects all migratory bird, their eggs, their body parts, or their nests. Essentially, all avian species native to the United States are protected under the provisions of the MBTA; introduced species and nonmigratory upland game birds are not protected by the MBTA. "Take" under the MBTA is defined "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect" protected birds (50 Code of Federal Regulations [C.F.R.] 10.12). The current list of species protected by the MBTA includes several hundred species. Nearly all native birds in the San Diego region are considered migratory. Permits for take of nongame migratory birds can be issued only for specific activities, such as scientific collecting, rehabilitation, propagation, education, taxidermy, or protection of human health or safety and personal property.

Executive Order (EO) 13112 requires federal agencies to "prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health effects that invasive species cause." An invasive species is defined by the EO as "an alien

species [a species not native to the region or area] whose introduction does or is likely to cause economic or environmental harm or harm to human health."

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. §§ 668–668d) prohibits the take of bald and golden eagles unless pursuant to regulations. "Take" under the BGEPA is defined to include a broad range of actions, including "to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, or molest or disturb." The term "disturb" is defined in regulations as to agitate or bother a bald or golden eagle to a degree that causes or is likely to cause, based on the best scientific information available: (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior (50 C.F.R. 22.3). In response to public comment regarding the removal of large trees that may occasionally be used by roosting or perching eagles, USFWS stated that such an action may constitute take "if the loss of the trees kills an eagle, or agitates or bothers a bald or golden eagle to the degree that results in injury or interferes with breeding, feeding, or sheltering habits substantially enough to cause a decrease in productivity or nest abandonment, or create the likelihood of such outcomes" (72 Federal Register [FR] 31132–31140). This suggests that habitat modifications may constitute take if it is substantial enough to cause, or create the likelihood for, a decrease in productivity or nest abandonment.

Magnuson-Stevens Fishery Management and Conservation Act, as amended 1996 (Public Law 104-267)

Federal agencies must consult with National Oceanic and Atmospheric Administration (NOAA) Fisheries on actions that may adversely affect essential fish habitat (EFH). EFH is defined as those "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." NOAA Fisheries encourages streamlining the consultation process using review procedures under NEPA, Fish and Wildlife Coordination Act, the Clean Water Act (CWA), and/or the federal ESA provided that documents meet requirements for EFH assessments under Section 600.920(g). EFH assessments must include (1) a description of the proposed action, (2) an analysis of effects, including cumulative effects, (3) the federal agency's views regarding the effects of the action on EFH, and (4) proposed mitigation, if applicable.

Clean Water Act

Section 404 of the CWA requires project proponents to obtain a permit from the Corps before performing any activity that involves any discharge of dredged or fill material into "waters of the

U.S.," including wetlands. Waters of the U.S. include navigable waters of the U.S., interstate waters, all other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries (33 CFR 328.3(a)). Many surface waters and wetlands in California meet the criteria for waters of the U.S. In accordance with Section 401 of the CWA, projects that apply for a Corps permit for discharge of dredged or fill material must obtain water quality certification from the appropriate Regional Water Quality Control Board (RWQCB), in this case the San Diego RWQCB, indicating that the project will not violate California water quality standards.

National Environmental Policy Act

NEPA establishes a national policy for promoting environmental protection that includes a multidisciplinary approach to considering environmental effects in decision making intended to "encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man…"

NEPA requires federal agencies to analyze and publicly disclose the environmental impacts of a proposed project. To do so, federal agencies are required to prepare either an Environmental Assessment or, where an action may significantly affect the quality of the human environment, an environmental impact statement (EIS). These documents explore project alternatives and identify the likely environmental consequences of each action. These documents contain statements of the environmental impacts and include mitigation measures to lessen the effects of a proposed project to the extent practicable. The significance of an impact is determined by both its context and its intensity. "Context" includes society as a whole, the affected region, the affected interests, and the locality. "Intensity" refers to the severity of impact, including "the degree to which the action may adversely affect an endangered or threatened species or habitat that has been determined to be critical under ESA."

Executive Order 11988, Floodplain Management

EO 11988 requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. To meet this objective "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its

responsibilities." This EO provides an eight-step process that agencies should carry out as part of their decision-making process on projects that have potential impacts to or within the floodplain.

Executive Order 11990, Protection of Wetlands

EO 11990 is an overall wetlands policy for all agencies managing federal lands, sponsoring federal projects, or providing federal funds to state or local projects. The purpose of this EO is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands." The EO requires federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. It requires the determination of whether a proposed project will be in or will affect wetlands. If so, a wetlands assessment must be prepared that describes the alternatives considered. The evaluation process follows the same eight steps as for EO 11988, Floodplain Management. Importantly, this EO applies to all wetlands, not just those falling under jurisdiction of the CWA.

Executive Order 13112, Invasive Species

EO 13112 requires federal agencies to "prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health effects that invasive species cause." An invasive species is defined by the EO as "an alien species [a species not native to the region or area] whose introduction does or is likely to cause economic or environmental harm or harm to human health."

1.3.2 State Laws and Regulations

California Environmental Quality Act

CEQA (Public Resources Code Section 15000 et seq.) requires identification of significant environmental effects of proposed projects (including impacts on biological resources) and avoidance (where feasible) or mitigation of the significant effects. CEQA applies to "projects" proposed to be undertaken or requiring approval by state and/or local governmental agencies. "Projects" are activities that have the potential to have a physical impact on the environment. The California Energy Commission licensing process, under the Warren-Alquist Act, is a CEQA-equivalent process.

California Endangered Species Act

The California Endangered Species Act (CESA) (Fish and Game Code Section 2050 et seq.) prohibits the "take" (defined as "to hunt, pursue, catch, capture, or kill") of state-listed species

except as otherwise provided in state law. CESA, administered by CDFW, is similar to the federal ESA although, unlike the federal law, CESA applies incidental take prohibitions to species currently petitioned for state-listing status (i.e., candidate species). State lead agencies are required to consult with CDFW to ensure that their authorized actions are not likely to jeopardize the continued existence of any state-listed species or result in the degradation of occupied habitat.

Under Section 2081, CDFW authorizes "take" of state-listed endangered, threatened, or candidate species through incidental take permits or memoranda of understanding if (1) the take is incidental to otherwise lawful activities, (2) impacts of the take are minimized and fully mitigated, (3) the permit is consistent with regulations adopted in accordance with any recovery plan for the species in questions, and (4) the applicant ensures suitable funding to implement the measures required by CDFW.

California Fish and Game Code Section 1602 – Streambed Alteration

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources are subject to regulation by CDFW under Fish and Game Code Section 1602. Under Section 1602, it is unlawful for any person, governmental agency, or public utility to do the following without first notifying CDFW:

- substantially divert or obstruct the natural flow of, or substantially change or use any material from, the bed, channel, or bank of any river, stream, or lake; or
- deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

The Fish and Game Commission defines "stream" as a body of water that flows at least periodically or intermittently through a bed or channel that has banks and supports fish or other aquatic life. This definition includes watercourses with a surface or subsurface flow that supports or has supported riparian vegetation. CDFW's jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife. In practice, CDFW typically extends its jurisdictional limit to the top of a stream, the bank of a lake, or outer edge of the riparian vegetation, whichever is wider. Riparian habitats do not always have identifiable hydric soils, or clear evidence of wetland hydrology as defined by the Corps. Therefore, CDFW wetland boundaries often include, but extend beyond, Corps wetland boundaries. Jurisdictional boundaries under Fish and Game Code Sections 1600–1616 (CDFW's Lake and Streambed Alteration Program) may encompass an area greater than that under the jurisdiction of CWA Section 404. Therefore, jurisdictional waters of the state include jurisdictional waters of the U.S.

Federal and state jurisdictions do overlap, but would remain distinct for regulatory administration and permitting purposes. A CDFW Streambed Alteration Agreement must be obtained for any project that would result in an impact on a river, stream, or lake.

California Fish and Game Code Section 3503 and 3503.5 – Protection of Birds, Nests, and Raptors

Section 3503 of the California Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3503.5 specifically states that it is unlawful to take, possess, or destroy any raptors (i.e., species in the orders Falconiformes and Strigiformes), including their nests or eggs. Typical violations of these codes include destruction of active nests resulting from removal of vegetation in which the nests are located. Violation of Section 3503.5 could also include failure of active raptor nests resulting from disturbance of nesting pairs by nearby project construction. This statute does not provide for the issuance of any type of incidental take permit.

Fully Protected Species under the California Fish and Game Code

Protection of fully protected species is described in Sections 3511, 4700, 5050, and 5515 of the California Fish and Game Code. These statutes prohibit take or possession of fully protected species and do not provide for authorization of incidental take of fully protected species.

California Native Plant Protection Act

The Native Plant Protection Act (NPPA) of 1977 (Fish and Game Code Sections 1900–1913) directed CDFG to carry out the Legislature's intent to "preserve, protect and enhance rare and endangered plants in this State." The NPPA gave the California Fish and Game Commission the power to designate native plants as "endangered" or "rare" and to protect endangered and rare plants from take.

Porter-Cologne Water Quality Control Act – California Water Code Section 13000 et seq.

Under the Porter-Cologne Water Quality Control Act, waters of the state fall under the jurisdiction of the appropriate RWQCB. The RWQCB must prepare and periodically update water quality control plans (basin plans). Each basin plan sets forth water quality standards for surface water and groundwater, as well as actions to control nonpoint and point sources of pollution to achieve and maintain these standards. Projects that affect wetlands or waters of the state may require waste discharge requirements from the RWQCB, which may be issued in addition to a water quality certification or waiver under Section 401 of the CWA.

California Coastal Act

Pursuant to California Public Resources Code (CPRC) Section 30000 et seq. the California Coastal Commission (CCC) regulates coastal resources within the Coastal Zone under jurisdiction of the California Coastal Act of 1976 (CCA) (as amended). The Coastal Zone means that land and water area of the State of California extending seaward to the state's outer limit of jurisdiction (3 miles offshore) including all offshore islands, and extending inland generally 1,000 yards from the mean high tide line of the sea. In significant coastal estuarine, habitat, and recreational areas, it extends inland to the first major ridgeline paralleling the sea or 5 miles from the mean high tide line of the sea, whichever is less, and in developed urban areas the zone generally extends inland less than 1,000 yards. If development is proposed within these areas (e.g., the Coastal Zone), a Coastal Development Permit issued by CCC or a local agency to which the CCC has granted permit authority is required (CCC 1994).

1.3.3 Local Plans and Policies

Natural Community Conservation Plans and Habitat Conservation Plans

Over the past two decades, regional planners have focused considerable effort on preparation of four habitat conservation plans (HCPs): the Multiple Species Conservation Program (MSCP) South, finalized in 1998 (SANDAG 1998); the Multiple Habitat Conservation Program (MHCP), finalized in 2003; the draft North County Multiple Species Conservation Program (North County MSCP),; and the East County MSCP, which is expected to begin after the North County MSCP is adopted.

Six jurisdictions (the cities of Carlsbad, Chula Vista, La Mesa, Poway, San Diego, and the southern portion of the County of San Diego), have approved HCPs and signed implementing agreements that collectively cover 20 percent of the San Diego region. Seven jurisdictions (the cities of Encinitas, Escondido, Oceanside, San Marcos, Santee, Vista, and the northern portion of the County of San Diego) are working on agreements that cover another 73 percent of the region. Seven jurisdictions (the cities of Coronado, Del Mar, El Cajon, Imperial Beach, Lemon Grove, National City, and Solana Beach), which collectively cover slightly more than 1 percent of the region, are not pursuing agreements because they have limited natural habitats within their boundaries. The remaining 6 percent of the San Diego region is on military land conserved by Integrated Natural Resource Management Plans, which are developed under voluntary, cooperative agreements among a Department of Defense installation, USFWS, and CDFW.

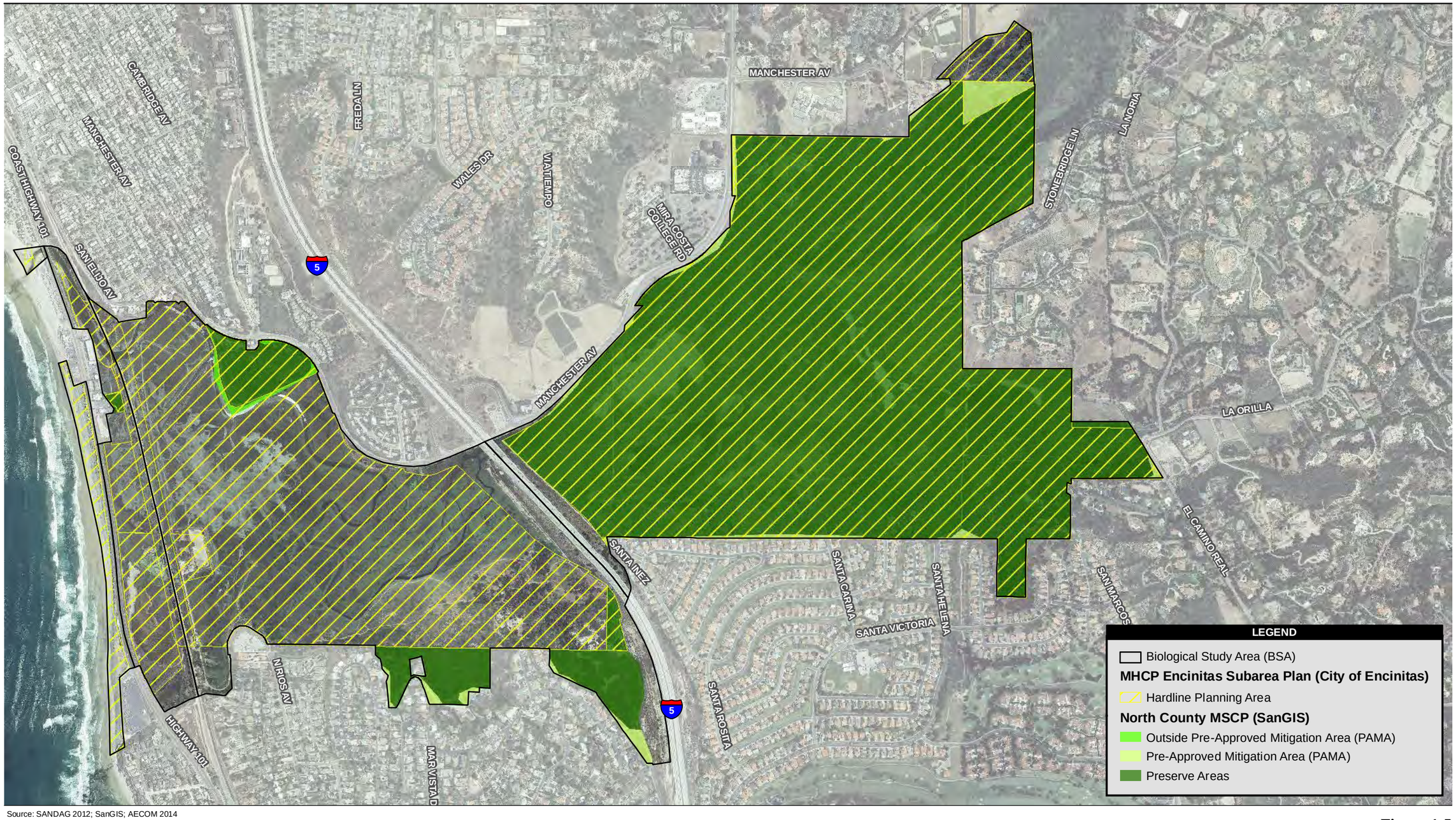
The regional habitat conservation plans in the San Diego region are designed to provide an umbrella of protection for multiple species by conserving their habitats and the linkages that

allow them to travel between habitats. The HCPs were designed under the California's Natural Communities Conservation Planning program.

Two regional planning documents cover the BSA, the North County MSCP (2009) and the MHCP (AMEC et al. 2003) (Figure 1-5). The North County MSCP expands the County MSCP into the northwestern unincorporated areas of San Diego County. The portions of the lagoon owned by the County of San Diego are within the NCMSCP. Portions of the BSA are within conservation areas referred to as the Preserve Area and Pre-Approved Mitigation Area under the draft North County MSCP (County of San Diego 2009).

The MHCP plan serves as an umbrella document to guide the preparation of subarea plans by each participating city and does not itself receive any permits (AMEC et al. 2003). To be approved, subarea plans must be consistent with the conservation and policy guidelines of the MHCP plan (AMEC et al. 2003). The Encinitas Subarea Plan is the MHCP implementing document within the Project Area (Ogden et al. 2001). The Encinitas Subarea Plan includes lands under the ownership of the SELC and State of California as well as some lands within the MHCP that are owned by the County. The Encinitas Subarea Plan designates the planned land use for the lagoon as parks/open space. The lagoon is considered a part of the Hardline Focused Planning Area within the Subarea Plan.

Both the North County MSCP and Encinitas Subarea Plan are currently in draft form; however, lands in both plans will eventually need to be reconciled in one plan or the other. Activities within these areas will need to be consistent with the North County MSCP or MHCP.



Source: SANDAG 2012; SanGIS; AECOM 2014

1,100 550 0 1,100 Feet

Scale: 1:13,200; 1 inch = 1,100 feet

Figure 1-5
North County MHCP and MSCP in the Biological Study Area

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CHAPTER 2.0
METHODS

2.1 BIOLOGICAL STUDY AREA

The BSA for the SELRP primarily includes the Reserve, as well as adjacent beach areas that could be affected by the project (Figure 2-1). The western extent of the BSA includes the beach area west of the lagoon (excluding the parking lot at Cardiff State Park) and extends into the water at the potential inlet location sites. The southern extent of the BSA includes the public right-of-way owned by the California Department of Transportation adjacent to I-5, but it does not include the private lands located on nearby slopes and uplands west of I-5. The northern boundary essentially coincides with Manchester Avenue and the Reserve boundary. The eastern boundary of the BSA does not extend as far east as the Reserve boundaries in certain areas since the focus of the restoration effort is wetland, not upland, habitats.

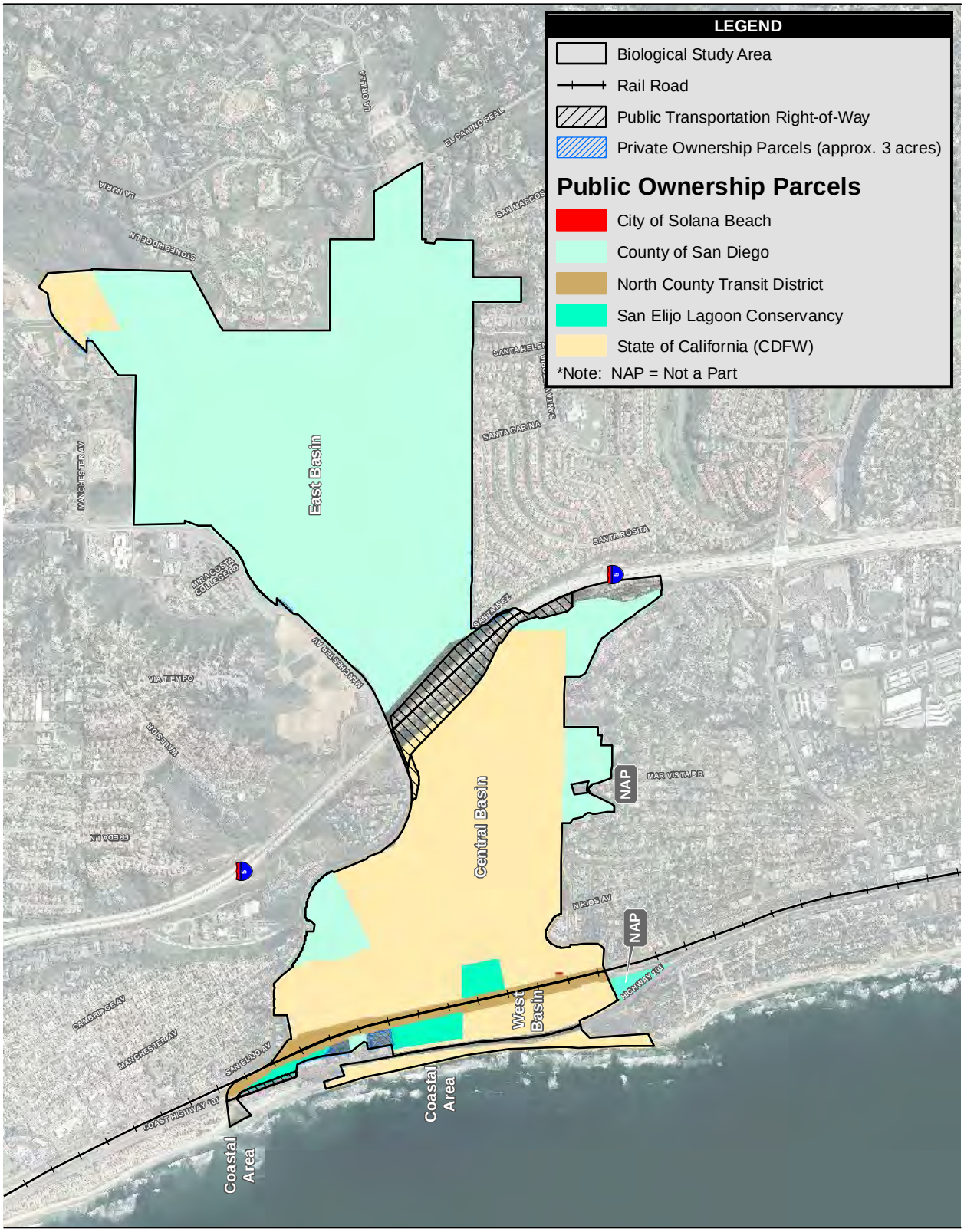
The BSA is divided into four distinct areas referenced as the east basin, central basin, west basin, and coastal area as shown in Figure 2-1. Each of these areas, general location, and approximate acreage are included in Table 2-1:

Table 2-1
San Elijo Lagoon Basin Acreages

Basin or Area Name	General Location	Acreage
East Basin	East of I-5	532
Central Basin	Between I-5 and NCTD rail line	356
West Basin	Between Highway 101 and NCTD railroad	53
Coastal Area	West of Highway 101	20
	TOTAL	**961**

2.2 BIOLOGICAL FIELD SURVEYS AND DATA SOURCES

Biological field surveys completed on-site by AECOM include vegetation mapping, rare plant surveys, and a jurisdictional delineation survey. Prior to initiating flora surveys, AECOM biologists consulted the CDFW California Natural Diversity Database (CNDDB) (RareFind Version 3.1.0; CDFG 2009), California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS 2010), Natural Resources Conservation Service Web Soil Survey (USDA 2009), and information collected during the San Elijo Lagoon BioBlitz (BioBlitz 2009) to assess the potential for special-status plant species to occur within the BSA.



Source: Landiscor 2010; SanElijoConservancy; SanGIS; AECOM 2012

2,000 1,000 0 2,000 Feet

Scale: 1:24,000; 1 inch = 2,000 feet

Figure 2-1
Biological Study Area and Land Ownership

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For the purposes of this report, species are considered to have special status if they meet at least one of the following criteria:

- Covered under the federal ESA or the California Endangered Species Act (CESA) (CDFW 2014b and 2014c);
- CDFG Species of Special Concern (CDFG 2009);
- CDFG fully protected species (CDFG 2009);
- Listed as sensitive by CNPS (2010);
- Covered under the draft North County MSCP (County of San Diego 2009); or
- Covered under the draft Encinitas Subarea Plan (Ogden et al. 2001)

AECOM did not conduct wildlife surveys or focused surveys for special-status wildlife species within the BSA. The lagoon is the focus of a number of ongoing annual and past wildlife survey efforts by various individuals and/or agencies including SELC, USFWS, Corps, and noted species experts like Richard Zembal. That information is incorporated into this report. Studies have included fish and invertebrate studies, wildlife inventories, and special-status wildlife studies. In addition, existing literature was reviewed to determine the potential for special-status wildlife species to occur within the BSA. The San Diego Natural History Museum (SDNHM) was also consulted to provide information on potential for bat species that might occur in the BSA.

2.2.1 Vegetation Mapping

Vegetation community mapping was conducted within the BSA between February 5 and February 25, 2010, by biologists Jonathan Dunn, Fred Sproul, and Lance Woolley of AECOM. Surveyors conducted vegetation mapping within the BSA by walking meandering transects and from selected vantage points that allowed an expansive view of the BSA. Transect spacing and vantage point locations were dynamic, based on habitat complexity and topography, and were close enough to allow complete visual coverage.

Habitats were classified based on the dominant and characteristic plant species, plant physiognomy, and soils in accordance with the *Draft Vegetation Communities of San Diego County* (Oberbauer et al. 2008), based on the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). Field biologists used orthotopographic maps at a scale of 1 inch equals 500 feet for vegetation mapping and the minimum mapping unit was 0.5 acre. Rare plants observed were documented during vegetation mapping.

2.2.2 Jurisdictional Waters and Wetlands Delineation Surveys

Delineation of jurisdictional wetlands and an evaluation of waters potentially under the jurisdiction of Corps, CDFW, and/or RWQCB were performed within the BSA. The formal jurisdictional delineation applied both a presurvey investigation and field reconnaissance to determine the presence (type, area, and extent) or absence of potential jurisdictional waters of the U.S. and state. A comprehensive description of the formal delineation methodologies (e.g., federal and state) is provided in the Draft Jurisdictional Delineation Report for Waters of the U.S. and State of California for the SELRP (AECOM 2012). Summary descriptions of the federal and state delineation methodologies are provided below.

Prior to conducting the field investigation for a formal jurisdictional delineation, an AECOM ecologist reviewed and identified areas with topographical configurations, vegetative signatures, previously mapped vegetation communities and riparian areas, wetlands, waters, and/or hydric soils that may suggest the potential or presence of wetlands at the time of the study. A general field reconnaissance within the survey area was then conducted to determine the focus of the field studies. After the prefield analysis and initial field reconnaissance were completed, a formal delineation of jurisdictional waters (including wetlands) occurring within the survey area was conducted by two AECOM ecologists at high tide and low tide. The dates and type of fieldwork conducted are listed in Table 2-2.

Table 2-2
Survey Dates and Personnel Conducting the Formal Field Delineation at the Reserve

Dates	Personnel	Activity
January 20, 2010	Joshua Zinn	Prefield analysis and survey
January 21, 2010	Joshua Zinn	General reconnaissance of Reserve at low tide
January 22, 2010	Joshua Zinn	General reconnaissance of Reserve at high tide
January 26, 2010	Lindsay Teunis and Joshua Zinn	Field survey and formal delineation fieldwork
January 27, 2010	Lindsay Teunis and Joshua Zinn	Field survey and formal delineation fieldwork
January 28, 2010	Lindsay Teunis and Joshua Zinn	Field survey and formal delineation fieldwork
February 02, 2010	Joshua Zinn	Groundtruthing formal delineation fieldwork

Delineation of Federal Waters

Jurisdictional waters of the U.S. (including wetlands) include those waters listed in 33 CFR 328 (Definitions of Waters of the United States). All waters of the U.S. were delineated to their jurisdictional limits as defined by 33 CFR 328.4 (Limits of Jurisdiction). The survey area that was formally delineated has the potential for the presence of, at a minimum, three types of federally regulated waters (wetlands, "other waters," and tidal waters)(AECOM 2012.

Delineation of State Waters

California Department of Fish and Wildlife

Jurisdictional waters of the state include those waters listed in the California Fish and Game Code Section 1600 et seq. Section 1601(a) is based on Title 14 California Code of Regulations 720, which designates waters of the state regulated by CDFW to be:

> "…all rivers, streams, lakes, and streambeds in the State of California, including all rivers, streams, and streambeds which may have intermittent flows of water."

However, in practice, CDFW usually extends its jurisdictional limit and assertion to the top of a bank of a stream, the bank of a lake, or outer edge of the riparian vegetation, whichever is wider.

Formal delineations for jurisdictional waters of the state as regulated by CDFW included all aquatic features occurring within the BSA, including any isolated aquatic features and the furthest riparian lateral extent.

Regional Water Quality Control Board

In practice, RWQCB usually extends its jurisdictional limit to waters of the state (as defined by California Water Code Section 13050[e]) that support or present beneficial uses, once beneficial uses are designated within a regional Basin Plan. Formal delineations for jurisdictional waters of the state as regulated by RWQCB included all aquatic features occurring within the BSA, including any isolated aquatic features, swale features, and the farthest riparian lateral extent.

California Coastal Commission

Jurisdictional waters of the state have been delineated pursuant to the guidance outlined within *Procedural Guidance for the Review of Wetland Projects in California's Coastal Zone*, Chapter 1, Section IV (Wetland Identification and Delineation); Chapter 3, Section IIB (Definition and Classification of Wetlands by California State Agencies) (CCC 1994). Sections 30121 and 13577(b) of the CCA provide the definition for a jurisdictional wetland occurring within the coastal zone.

In the coastal zone, the CCC, with the assistance of CDFW, is responsible for determining the presence of wetlands subject to regulation under the CCA. The CCC and CDFW only require the presence of one wetland parameter (e.g., wetland hydrology, hydric soils, or hydrophytic vegetation) for an area to qualify as a wetland within the coastal zone. As the primary wetland

consultant to the CCC, CDFW essentially relies on the USFWS wetland definition and classification system, which is based upon *Classification of Wetland and Deepwater Habitats of the United States* (Cowardin et al. 1979). Jurisdictional wetland delineations within the coastal zone were conducted based upon the one-parameter method outlined in CDFW and USFWS guidance documents and classification manual(s) to define their presence and jurisdictional extent.

2.2.3 Special-Status Plant Surveys

Rare plant surveys were conducted within the BSA between March 26 and June 4, 2010, by AECOM botanists Jonathan Dunn, Fred Sproul, and Lance Woolley. Other rare plant observations were provided by County Park Ranger Susan Welken from various dates in 2010.

A list of potentially occurring sensitive plant species was compiled through searches of the CDFG CNDDB (CDFG 2010) and Jepson Online Interchange (2010), and from the San Elijo Lagoon BioBlitz conducted May 15 and 16, 2009 (BioBlitz 2009).

Rare plant surveys followed survey guidelines from *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants* (USFWS 2000); *Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities* (CDFG 2009); and *CNPS Botanical Survey Guidelines* (CNPS 2001).

The portions of the BSA with potential to support rare plants were surveyed by botanists walking meandering transects based on distribution of the resource and topography. The surveys included all accessible locations within the BSA where suitable habitats for sensitive plant species were present. Suitable habitats were determined based on geography, slope aspect, soil substrate, vegetation community, associated plant species, and familiarity with each species based on reference populations and historical surveys conducted in the region.

Survey dates were selected based on the most phenologically appropriate time for each plant species, when reproductive structures (i.e., flowers and fruits) and distinctive leafy parts were present and easily identifiable. Several rounds of focused surveys were required to accommodate the distinct phenologies of different rare plant species. If a sensitive plant population was located, the population was assessed and the number of individuals was counted. All sensitive plant locations identified were recorded with a Global Positioning System unit or onto an orthotopographic map and digitized into a geographic information system

2.2.4 Wildlife Surveys

AECOM did not conduct wildlife surveys for this project; however, San Elijo Lagoon has been studied extensively for decades by a variety of individuals and/or agencies. Wildlife surveys have been consistently conducted for various species. This existing knowledge makes up the baseline describing wildlife species known to occur, or with the potential to occur, within the BSA. Wildlife surveys conducted at San Elijo Lagoon that were reviewed for this report are listed in Table 2-3 and provided in Appendices C through M of this report. As noted, these

Table 2-3
Wildlife Surveys Conducted at San Elijo Lagoon within the Last 5 Years

Survey Information	Data Collection Date	Source
General Wildlife Survey		
San Elijo Lagoon BioBlitz	May 15 through 16, 2009	Multiple Participants Listed
Monthly Bird Count Data San Elijo Lagoon	2010, 2011	Robert Patton (ebird database)
Fish and Benthic Invertebrate Surveys		
San Elijo Lagoon Fish and Invertebrate Master, 2009	1989–1994 (summer/winter); 1995 –1999 (summer, fall, winter, spring); 2000–2009 (summer/winter)	San Elijo Lagoon Conservancy (SELC)
San Elijo Lagoon Spring Invertebrate Sampling: Inlet and Nature Center	2007–2009	U.S. Army Corps of Engineers (Corps)/SELC
San Elijo Lagoon Fish Sampling – Spring Surveys: Inlet and Nature Center	2007–2009	SELC
Fish and Invertebrate Data Collection Methods	2006	Corps/SELC
Butterfly Surveys		
Wandering (Salt Marsh) Skipper Presence/Absence Surveys: Correspondence and Info	July and August 2010	SELC/San Diego Association of Governments
Avian Surveys		
California Gnatcatcher Sightings from San Elijo Lagoon Monthly Bird Counts	2006–2011	Robert Patton
California Least Tern and Western Snowy Plover Survey Summary: San Elijo Lagoon & Cardiff State Beach	2006–2009	Robert Patton, Shauna Wolf
California Least Tern and Western Snowy Plover Site and Project Summaries	2010, 2011	Robert Patton
Western Snowy Plover and California Least Tern status at California Department of Parks and Recreation Sites in San Diego County	2010, 2011	Shauna Wolf
Belding's Savannah Sparrow Survey, San Elijo Lagoon Ecological Reserve	2006, 2009	Robert Patton. Maryanne Bache, Monica Alfaro
Belding's Savannah Sparrow Sightings from San Elijo Lagoon Monthly Bird Counts	2010, 2011	Robert Patton

Survey Information	Data Collection Date	Source
Light-footed Clapper Rail Sightings from San Elijo Lagoon Monthly Bird Counts	2006–2011	Robert Patton
Light Footed Clapper Rail Management, Study, and Propagation in California	2009, 2011, 2012, and 2013	Richard Zembal, Susan Hoffman, John Konecny, Laurie Conrad, Charles Gailband, Michael Mace
Light-footed Clapper Rail Status and Distribution in California	2010	Richard Zembal, Susan Hoffman, John Konecny
Least Bell's Vireo Sightings from San Elijo Lagoon Monthly Bird Counts	2010, 2011	Robert Patton
Southwestern Willow Flycatcher Sightings from San Elijo Lagoon Monthly Bird Counts	2010, 2011	Robert Patton
Mammal Surveys		
Pacific Pocket Mouse (PPM) Habitat Assessment – data polygons	May 2010	U.S. Fish and Wildlife Service

surveys were conducted by various individuals and/or agencies, and varying methodology and level of detail are available for each survey. Wildlife surveys completed within the last 5 years include general wildlife surveys; general fish and benthic invertebrate surveys; butterfly surveys; and species-specific surveys conducted for western snowy plover (*Charadrius alexandrines nivosus*), California least tern (*Sternula antillarum browni*), Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), and pacific pocket mouse (*Perognathus longimembris pacificus*). Methods for each survey conducted at San Elijo Lagoon are described below.

Other Background Data

The data summarized in this report are primarily from recent sources. However, there was a prior data collection effort for a previously considered lagoon restoration project in 2001–2002 performed by MEC Analytical. For summary tables listing the broad range of animals detected or possibly in the study area, (Section 3 of this report), those MEC data are noted. However, because it is 10 years old or possibly older, those data are not utilized to make a current determination about "detection."

General Wildlife Surveys

General wildlife information has been provided by the SELC through their ongoing efforts to produce a thorough inventory of the species within the Reserve. General wildlife surveys facilitated by the SELC were conducted May 15–16, 2009, and are referred to as the BioBlitz. The BioBlitz consisted of a 24-hour inventory of species of plants and animals found in a given area. Surveyors included local species experts and members of the general public.

Fish and Benthic Invertebrate Surveys

Fish and invertebrate monitoring and analyses have been conducted within the BSA by the SELC since 1989. Currently, fish and invertebrate monitoring is occurring at two of the existing SELC water quality sampling sites, as shown in Figure 2-2. This allows for the comparison of water quality to the biodiversity of each sampling location. The monitoring is being conducted to determine baseline conditions over time, and to document trends and fish and invertebrate population densities. The National Marine Fisheries Service has confirmed that, for the purposes of this project, 3 years of data is sufficient for analysis. Accordingly, data collected from 2007 through 2009 are summarized for this report.

Fish were monitored within the BSA using two 50-meter (m) blocking nets (3-millimeter [mm] mesh) that span the entire channel length and were set approximately 10 m apart (creating a rectangle with the channel banks). A 15-m (3- mm mesh) seine was attached to two brails and passed between the blocking nets. Each fish pass was logged as a pass and species were recorded. The first 100 individuals of each species were measured and the remaining individuals were counted. This process was repeated until the fish numbers were depleted (or close to depletion). Upon depletion, the blocking nets were closed in on each other, representing the last pass for the site.

Benthic invertebrates were also monitored at the two water quality sites. Two steps were taken when sampling for benthic invertebrates. First, nine shallow cores were taken to estimate the abundances of the small, shallow-dwelling invertebrates. Cores were collected by pushing a cylindrical “clam gun” (15 centimeters [cm] in diameter) 5 cm into the sediment. These nine cores were split into thirds where three were high channel, three were mid-channel, and three were middle channel (thalweg). Samples were sieved through a 1-mm screen in the field. All large, easily identified animals were counted and released; others were preserved and sorted, and then identified and counted under a dissecting microscope in the lab. With the second step, another nine cores were taken to estimate abundances of large, deep-dwelling invertebrates (mainly bivalves). The sampling method was the same except the “clam gun” was pushed 20 cm into the sediment and was sieved through a 3-millimeter screen.

Butterfly Surveys

A butterfly survey was conducted on July 9, 2010, by the SELC. Presence-absence surveys were conducted to confirm optimal habitat for the wandering (salt marsh) skipper (*Panoquina errans*). Surveys were conducted by walking meandering transects in areas of potential habitat. All sightings were recorded and mapped. A second survey was conducted by SANDAG on August 12, 2010. The first survey on August 12, 2010, was conducted between 10:53 a.m. and 1:45 p.m.

in transitional marsh habitat starting along the western slope of I-5 and continuing along the Rios Avenue path south of the marsh. The second survey on August 12, 2010, was conducted between 2:44 p.m. to 3:27 p.m., following an elevated walkway loop at the San Elijo Lagoon Visitor Center. Butterflies were detected using a Pollard walk (Pollard 1977) with two observers moving along a meandering line through potential habitat.

Avian Surveys

Monthly bird count surveys have been organized by Robert Patton, consulting wildlife biologist, since 2006. The bird count surveys are conducted by a group of volunteers that look for birds along routes walked in various areas of the lagoon. For the purposes of this report, bird count data collected during 2011 were reviewed.

Specific surveys conducted for western snowy plover, California least tern, and Belding's savannah sparrow involve presence/absence surveys conducted annually by Robert Patton from 2006 to 2011 specifically when the timing was optimal for detections (Patton 2010). No species-specific surveys for Belding's savannah sparrow were conducted during 2010 or 2011. This species was noted during monthly bird counts for this period. Survey periods focused on the species breeding season when visual and auditory detections are likely to be highest, and when the species is known to migrate to and/or through the BSA.

Mammal Surveys

The USFWS has identified potential Pacific pocket mouse habitat within the East Basin of San Elijo Lagoon, as shown in Figure 2-3. No trapping was performed.

Source: SANDAG 2012; SanGIS 2014; CityofEncinitas 2011; AECOM 2014

1,100 550 0 1,100 Feet

Scale: 1:13,200; 1 inch = 1,100 feet

Figure 2-2
Water Quality Sample Locations

Path: P:\2009\09080064_SELRP_EIR\6.0 GIS\6.3 Layout\BTR_BA\sample_loc_.mxd, 01/28/11, SteinB

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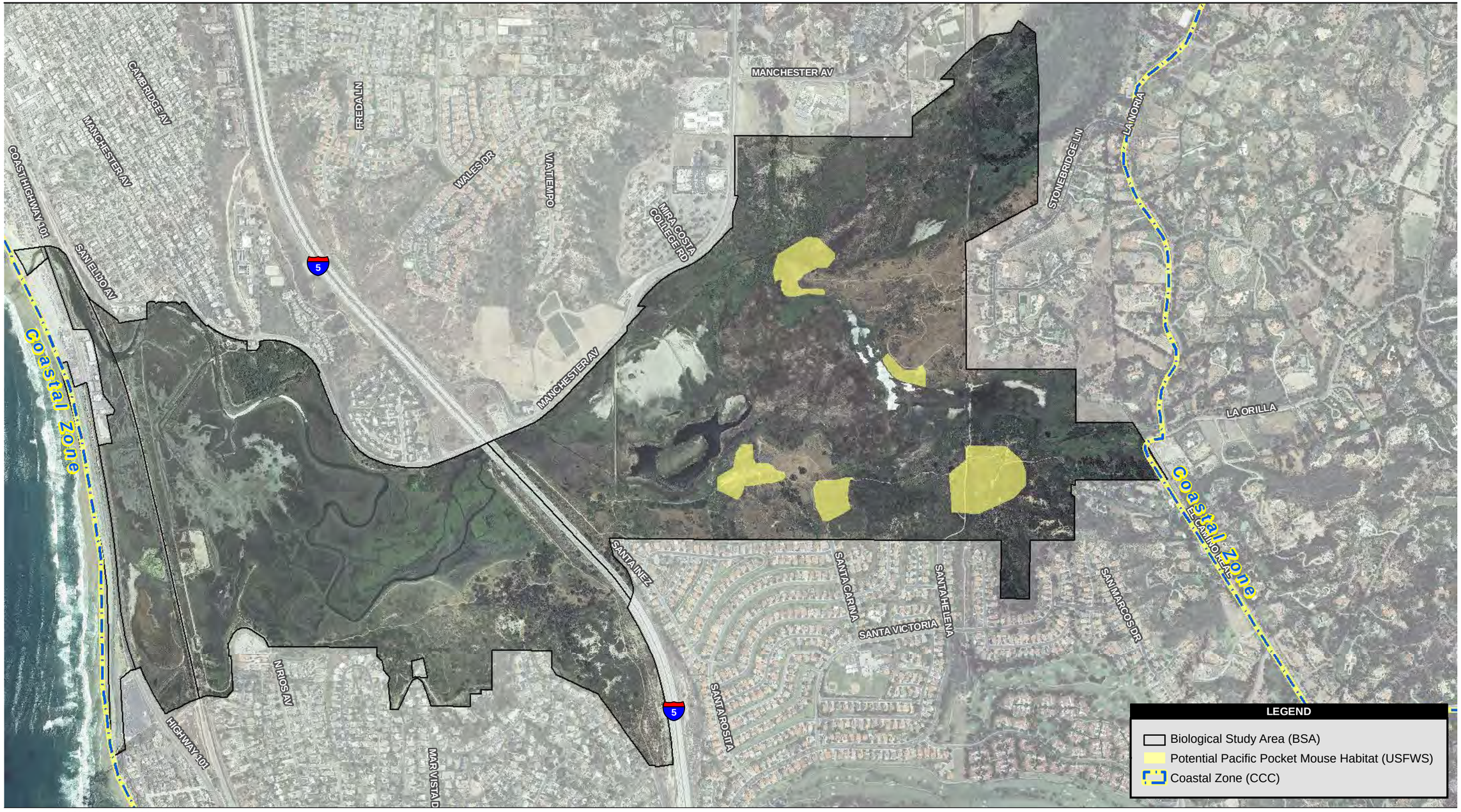

Source: SANDAG 2012; SanGIS; AECOM 2014

1,100 550 0 1,100 Feet

Scale: 1:13,200; 1 inch = 1,100 feet

Figure 2-3
Potential Pacific Pocket Mouse Habitat

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